

# A REVISION OF THE AUSTRALIAN THERAPONS WITH NOTES ON SOME PAPUAN SPECIES.

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(Plates X to XIII and One Text-figure.)

## INTRODUCTION.

THE very confused literature relating to the Australian species of the genus *Therapon* and their allies has been the cause of considerable difficulty in their identification. Many closely related forms, which were insufficiently described by their authors, have hitherto remained almost unknown, and their rediscovery, without reference to the types, has been almost or quite impossible. We are fortunate, therefore, in having access to the large series of specimens included in the collections of the Queensland Museum, the Australian Museum, and the Macleay Museum at the University of Sydney, where are preserved most of the types of the several species briefly defined by Count Castelnau, Sir William Macleay, and Mr. C. W. de Vis. These we have examined and redescribed in detail when necessary, and have effected considerable changes in their synonymy. Figures are given of all those species of which no reliable illustrations have been published, while the better-known forms are shortly defined for their easy recognition.

We wish to acknowledge here the invaluable assistance afforded us by Dr. Thomas L. Bancroft, of Eidsvold on the Burnett River, Queensland, who has spared no pains to secure beautifully preserved material for us from various localities. Without his help, much of the matter dealt with in the following pages would have remained unknown. We are also indebted to Mr. Ellis Troughton and Mr. Frank McNeil, of the Australian Museum, for much patient help in counting the scales of large series of specimens, and other assistance.

## THERAPON Cuvier.

*Therapon* Cuvier, Règne Anim., ed. 1, ii, 1817, p. 295 (*Holocentrus servus* Bloch). Lapsus calami for *Therapon*.

*Therapon* Cuvier & Valenciennes, Hist. Nat. Poiss., iii, 1829, p. 125; Günther, Brit. Mus. Catal. Fish., 1, 1859, p. 274; Day, Fish. India, pt. i, 1875, p. 68; Bleeker, Atlas Ichth., vii, 1876, p. 110; Ogilby, Edib. Fish. N. S. Wales, 1893, p. 26; Jordan & Thompson, Proc. U. S. Nat. Mus., xli, 1912, p. 535.

*Dania* Cuvier & Valenciennes, *ibid.*, p. 138 (*D. argentea* Cuv. & Val.).

*Pterapon* Gray, in Hardwicke, Illustr. Ind. Zool., 1832. Nomen emend.

*Mesopristes* Bleeker, Arch. Nérl. Sci. Nat., xi, 1876, p. 267 (*M. macracanthus* Blkr. = *T. argenteus* C. & V.); *id.*, Atlas Ichth., vii, 1876, p. 110.

*Autisthes* de Vis, Proc. Linn. Soc. N. S. Wales, ix, pt. 2, 19 Aug. 1884, p. 398 (*A. argenteus*, de Vis = *T. puta* Cuv. & Val.).

*Eutherapon* Fowler, Proc. Acad. Nat. Sci. Phila., 1904, p. 527 (*T. theraps* Cuv. & Val.).

Body ovate to elliptical, more or less compressed. Scales small or moderate, adherent, finely ctenoid. Lateral line continuous, extending on the base of the caudal,

the tubes simple, not quite reaching the margin of the scale. Head large, with moderate or rather long snout and narrow preorbital, partly covered with small, usually cycloid scales. Mouth terminal and protractile, with moderate, oblique cleft, the jaws equal; lips rather thick, plicate; maxillary exposed distally. Teeth in a band in each jaw variable in form; on the vomer and palatines, if present, caducous. Preorbital serrated in the young, preopercle more or less strongly serrated; opercle with one or two pungent spines; suprascapular and coracoid bones generally exposed. One more or less deeply notched dorsal fin, with xii-xiii (rarely xi or xiv) 8-14 rays, the spinous portion longer than the soft and depressible in a groove. Caudal fin rounded, or truncate, or emarginate, with 17 principal rays, 15 of which are divided. Anal short, with iii 7-12 rays. Pectoral with 12 to 16 rays, varying from pointed and asymmetrical to rounded and symmetrical. Ventrals close together, inserted well behind the pectorals. Gill-membranes separate, free from the isthmus; six branchiostegals; pseudobranchiæ large; gill-rakers in moderate number, short and stout. Air-bladder large, mesially constricted. Pyloric appendages in small or moderate number. Vertebrae 12 + 13 = 25. Ribs inserted on parapophyses. (*θ ῥάπιον*, an attendant.)

Fishes of small or moderate size from the Indian and Western Pacific Oceans and the fresh waters of Australia and New Guinea.

In its commonly accepted form, the genus *Therapon* includes a number of very dissimilar fishes, the typical forms of which are almost entirely marine, while others are estuarine, and many are confined strictly to fresh waters. Their affinities have been subject to considerable discussion by various authors, and they have been included in the families *Pristipomatidæ* by Günther, and in the *Lutjaninæ* by Boulenger, while Jordan and his colleagues have adopted the family *Theraponidæ* to accommodate them. Regan, having examined the skeletal characters, regards *Therapon* as a Serranid.

Their subdivision into natural groups has been attempted by several writers with more or less success. Cuvier and Valenciennes distinguished *Datnia* and *Pelates* in 1829, which, however, have been reunited with *Therapon* by most authors.<sup>1</sup>

The latter genus is readily separable by the junction of the gill-membranes with the isthmus and by its dentition, but we are unable to define the former, though its general appearance is very different to that of the typical *Therapon*. *Eutherapon* has been founded on *T. theraps* by Fowler which has larger scales than the typical *T. servus*. The relative lengths and strength of the dorsal and anal spines, and the presence or absence of strong bony ridges on the cranium, suggest characters which might be used for subdivision purposes, as also does the varying structure of the scales. The extremes of all these apparently merge one into another, however, and any one character is not always constant in obviously closely related species. An investigation of the skeletal characters may reveal a ready means of subdivision, but we have been unable to undertake this phase of the work.

The freshwater species of Australia include such widely diverse representatives as the small-scaled *T. bidyana* in which the suprascapular bone is exposed, and *T. percooides* in which it is hidden and the scales are large. They are united, however, by a chain of intermediate forms which appear to defy subdivision, so we reluctantly accept the genus *Therapon* in its broad sense, distinguishing only *Pelates* as a well-defined group.

<sup>1</sup> The genus *Helictes* Cuvier & Valenciennes has also been included in the synonymy of *Therapon* by some authors, but the trilobate character of its teeth is apparently constant, and readily distinguishes it from its allies.

As is usual in freshwater fishes with a wide range, the Australian fluviatile Therapons exhibit considerable variation in both form and colour-marking, and it is only by an examination of large series of specimens that we have been able to determine, to our own satisfaction, the limits of the various species referred to in this paper. The fin-formulæ are generally constant, but in the widely distributed *T. unicolor* even the number of dorsal spines varies from eleven to thirteen. The scale-counts, though variable within certain limits, appear to afford useful characters for the discrimination of species. Owing to the irregularity of the squamation, however, the scales must be counted in series, preferably upwards and backwards, and not individually. We have found the number of scales between the lateral line and the middle of the spinous dorsal fin (supralateral scales), and excluding the dorsal sheath, to afford a ready guide to some species.

The freshwater Therapons range over the whole of Australia, and though most abundant in the well-watered parts of Queensland, at least two species, *T. unicolor* and *T. percoides*, extend into the small streams and waterholes of Central Australia. Some are evidently capable of resisting long periods of drought by lying dormant in the mud at the bottom of the pools in which they find themselves, until the advent of rain, and consequent filling of the pools with water, again vitalises them into fresh activities. They are a valuable item in the food supply of both aboriginals and colonists, some species attaining considerable proportions. The marine species, though edible, are but little valued as food.

The species here dealt with may be distinguished by the following key:—

- a*<sup>1</sup>. Lower opercular spine greatly developed, produced beyond the opercular lobe. Body with longitudinal dark bands; vertical fins with dark markings, spinous dorsal with a large dark blotch.
  - b*<sup>1</sup>. Scales larger, 7½-8 supralateral scales .. .. . *theraps*.
  - b*<sup>2</sup>. Scales smaller, 13-15 supralateral scales.
    - e*<sup>1</sup>. Body narrower, the depth slightly less than the length of the head; longitudinal bands almost straight .. .. . *puta*.
    - e*<sup>2</sup>. Body deeper, the depth slightly greater than the length of the head; longitudinal bands strongly curved .. .. . *servus*.
- a*<sup>2</sup>. Lower opercular spine smaller, not produced beyond the opercular lobe; coloration various, no large dark blotch on the spinous dorsal.
  - d*<sup>1</sup>. Suprascapular bone not exposed, hidden by scales.
    - e*<sup>1</sup>. Normally thirteen dorsal spines.
      - f*<sup>1</sup>. 33-38 series of scales; body with five narrow dark cross-bars.. .. . *percoides*.
      - f*<sup>2</sup>. 52-56 series of scales; caudal fin with a broad oblique bar on each lobe *caudovittatus*.
    - e*<sup>2</sup>. Normally twelve dorsal spines (rarely xiii or xi); coloration nearly uniform, or with small dark spots .. .. . *unicolor*.
  - d*<sup>2</sup>. Suprascapular bone exposed, not hidden by scales.
    - g*<sup>1</sup>. Normally twelve dorsal spines.
      - h*<sup>1</sup>. Scales smaller, 75-90 between the origin of the lateral line and the hypural joint.
        - i*<sup>1</sup>. Nostrils close together; coloration nearly uniform .. .. . *bidjana*.
        - i*<sup>2</sup>. Nostrils widely separate; a dark shoulder-mark and dark cross-bars on the body; fins spotted .. .. . *humeralis*.
    - h*<sup>2</sup>. Scales larger, less than 60 between the origin of the lateral line and the hypural joint.
      - j*<sup>1</sup>. Dorsal and anal spines very strong, longest dorsal spine longer than the rays, and second anal spine much longer than the third.
        - k*<sup>1</sup>. Nostrils close together; maxillary entirely covered by the lip .. .. . *interruptus*.
        - k*<sup>2</sup>. Nostrils well separated; angle of the maxillary not covered by the lip .. .. . *argentens*.
- j*<sup>2</sup>. Dorsal and anal spines weaker, the longest dorsal spine not longer than the rays, second anal spine not or but little longer than the third.

- $l^1$ . Caudal fin slightly rounded : eleven anal rays .. .. . *carbo*.  
 $l^2$ . Caudal fin emarginate : eight to ten anal rays.  
 $m^1$ . 46-50 series of scales below the lateral line .. .. . *juliginosus*.  
 $m^2$ . 51-55 series of scales below the lateral line .. .. . *bancrofti*.  
 $q^2$ . Normally thirteen dorsal spines.  
 $n^1$ .  $6\frac{1}{2}$ - $7\frac{1}{2}$  supralateral scales ; head larger, one third or more than one third of the length to the hypural ; body with dark bands, and dark spots at base of caudal .. .. . *trimaculatus*.  
 $n^2$ . 8-11 supralateral scales ; head smaller, less than one third of the length to the hypural ; coloration nearly uniform.  
 $o^1$ . Scales smaller, 58-67 below the lateral line and 63-71 above it .. .. . *hillii*.  
 $o^2$ . Scales larger, 49-56 below the lateral line and 51-61 above it .. .. . *parriceps*.

#### THERAPON THERAPS Cuvier & Valenciennes.

- Therapon theraps* Cuvier & Valenciennes, Hist. Nat. Poiss., iii, 1829, p. 129, pl. liii ; Günther, Brit. Mus. Cat. Fish., i, 1859, p. 274 ; Day, Fish. India, 1878, p. 70, pl. xviii, fig. 6 ; Castelnau, Proc. Zool. Soc. Vict., ii, 1873, p. 8 ; Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 1877, p. 270 ; Macleay, Proc. Linn. Soc. N. S. Wales, v, 1881, p. 360 ; Weber, "Siboga" Exped., lvii, 1913, p. 255, fig. 64—color variations of young.  
*Therapon obscurus* Cuvier & Valenciennes, *ibid.*, p. 135 ; Günther, *ibid.*, p. 275.  
*Therapon squavidus* Cuvier & Valenciennes, *ibid.*, p. 156 ; Günther, *ibid.*  
*Therapon transversus* Cuvier & Valenciennes, *ibid.*, p. 137 ; Günther, *ibid.*  
*Therapon cinereus* Cuvier & Valenciennes, *ibid.*, p. 138 ; Günther, *ibid.*, p. 276.  
 $? Datnia virgata$  Cuvier & Valenciennes, *ibid.*, vii, 1831, p. 480.  
 $? Therapon virgatus$  Günther, *ibid.*, p. 276.  
 $? Therapon rubricatus$  Richardson, Ann. Mag. Nat. Hist., ix, 1842, p. 127.  
*Therapon (Datnia) theraps* Bleeker, Atlas Ichth., vii, 1876, p. 111, pl. cccxxi, fig. 1.  
*Therapon nigripinnis* Macleay, *ibid.*, p. 366.

D. xii 10 ; A. iii 8-9 ; P. 14-15 ; V. i 5 ; C. 17. 56-59 series of scales between the origin of the lateral line and the hypural joint, counted above the lateral line, and 49-50 below it ; 7-8 between the lateral line and the middle of the spinous dorsal. Cheek-scales in 5-6 rows.

Proportions of an Australian specimen 153 mm. long :—Depth 3.2 in the length to the hypural joint ; head 3.5 in the same. Eye equal to the length of the snout, 3.5 in the head, and a little greater than the interorbital space which is 4.2 in the head. Fourth dorsal spine 1.6, anterior dorsal ray 2.2, third anal spine 2.6, and anterior anal ray 2.2 in the head.

Body ovate, compressed. Upper surface of cranium closely covered with exposed, arborescent bony ridges. Preorbital more or less serrated. Preoperculum evenly denticulate, the teeth largest on the broadly rounded angle. Suprascapular and coracoid bones strongly denticulate. Operculum with two spines, the lower produced beyond the opercular lobe. Maxillary reaching to below the anterior portion of the eye. Nostrils large, with skinny, lobular margins ; they are separated by a space equal to their own diameter.

Dorsal spines strong, the fourth the longest and much higher than the rays ; the last is much longer than the penultimate one : the margin of the soft dorsal is straight and pointed posteriorly. Third anal spine longer than the second but shorter than the anterior rays : margin of the soft anal a little excavate, pointed posteriorly. Pectorals and ventrals pointed, the first ray of the latter with a short filament which does not reach the vent. Caudal emarginate.

Color-marking greatly developed in the young, less distinct or wanting in adults. Color more or less silvery in preservative with three broad, longitudinal, dark



bands; the upper covers the greater portion of the back, and the second extends from the eye to the upper half of the caudal peduncle. A large black blotch on the membrane between the third and seventh spines which is variable in size. Soft dorsal and anal fins with striking black and white markings in the young which are greatly reduced in larger examples. Caudal fin with a median horizontal and two oblique bars, together with large blackish patches which cover the greater part of each lobe.

The foregoing description is based on six specimens 83-169 mm. long, of which two are from India, being part of Dr. Day's collection. The type of *T. nigripinnis* Macleay, from Rockingham Bay, Queensland, does not differ from them in any structural details, though its markings are very obscure. *Therapon rubricatus* Richardson was based upon a color drawing of a fish from North-Western Australia; it has been regarded as probably identical with *T. theraps* by Day and Bleeker, and there seems to be no reason to doubt their conclusion.

*T. theraps* has been recorded from the following Australian localities:—Port Essington, North Australia (*Richardson*); North-Western Australia (*Richardson*, as *T. rubricatus*); Port Darwin, North Australia (*Castelnau*); Palm Island to Flinders Island, Queensland (*Alleyne & Macleay*); Rockingham Bay, Queensland (*Macleay*, as *T. nigripinnis*). We have examined specimens from the Burnett River and Yam Creek, Queensland, and Torres Strait.

**THERAPON PUTA** Cuvier & Valenciennes.

*Therapon puta* Cuvier & Valenciennes, Hist. Nat. Poiss., iii, 1829, p. 131; Valenciennes, Illustr. Poiss. Cuv. Règne Anim., 1843, pl. xii, fig. 2; Day, Fish. India, 1875, p. 69, pl. xviii, fig. 3.

*Therapon ghebul* (Ehrenberg) Cuvier & Valenciennes, *ibid.*, p. 133; Günther, Brit. Mus. Catal. Fish., i, 1859, p. 281.

*Therapon trivittatus* Günther, *ibid.*, p. 280; Macleay, Proc. Linn. Soc. N. S. Wales, v, 1881, p. 361 (Not *Coius trivittatus* H. Buchanan.)

*Therapon (Datnia) puta* Bleeker, Atlas Ichth., vii, 1876, p. 112, pl. cccxl, fig. 2.

*Autisthes argenteus* de Vis, Proc. Linn. Soc. N. S. Wales, ix, 1884, p. 398.

D. xi i 10; A. iii 9. About 100 series of scales above the lateral line between its origin and the hypural joint, and about 90 below it; 12-13 scales between the lateral line and the middle of the spinous dorsal fin. Cheek-scales in about 6 rows.

Proportions of a specimen 103 mm. long:—Depth 3.7 in the length to the hypural joint; head 3.3 in the same. Eye 3.7 in the head, a little longer than the snout and the interorbital width. Snout 4, interorbital width 4.3 in the head. Fifth dorsal spine 1.6, first dorsal ray 1.8, and third anal spine 2.1 in the head.

Body elongate, compressed. Cranium and interorbital space with low bony ridges. Preorbital finely serrated. Preoperculum with spines on the posterior margin which are very strong and enlarged on the angle; lower margin denticulate. Lower opercular spine enlarged and produced beyond the opercular lobe. Suprascapular exposed, denticulate. Fifth dorsal spine longest and higher than the anterior rays; the last spine is much longer than the penultimate one. Third anal spine longer than the second.

Light brown on the back, paler below. Three or four dark bars, which are almost straight, extend along the sides; the first commences on the nape and runs close to the dorsal profile to the end of the spinous dorsal; the second from above the nostrils to the soft dorsal and along the back of the caudal peduncle; the third from the snout to the upper half of the caudal peduncle; the fourth, if present, from behind the pectoral to the lower half of the caudal peduncle. The third bar extends along the middle of the caudal fin which also bears two oblique bars on each lobe. Spinous dorsal with a large black blotch, soft dorsal and anal with darker oblique bars.

The above definition is based on two specimens 95 and 103 mm. long from Manila, Philippine Islands. The species has been recorded from Torres Strait by Macleay as *T. trilineatus*, and from the Queensland coast by de Vis under the name *Autisthes argenteus*. The specimen on which the latter name is based is preserved in the Queensland Museum (No. 11/176), and, though stuffed and painted silver, leaves no doubt as to its identity with *Therapon puta*.

#### Therapon servus Bloch.

*Holocentrus servus* Bloch, Ausl. Fisch., iv, 1797, pl. cccxxxviii, fig. 1.

*Grammistes servus* Bloch & Schneider, Syst. Ichth., 1801, p. 185.

*Therapon servus* Günther, Brit. Mus. Cat. Fish., i, 1859, p. 278 (part); Steindachner, Sitzb. Akad. Wiss. Wien, lvi i, 1867, p. 310; Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 1877, p. 270; Macleay, Proc. Linn. Soc. N. S. Wales, ii, 1878, p. 348; id., v, 1881, p. 361; Castleman, Proc. Linn. Soc. N. S. Wales, iii, 1879, p. 350; Ogilby, Cat. Fish. N. S. Wales, 1886, p. 12; Jordan & Thompson, Proc. U. S. Nat. Mus., xli, 1912, p. 536, fig. 1.

*Therapon jarbua* Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx, 1879, p. 349; Stead, Proc. Linn. Soc. N. S. Wales, xxxi, 1906, p. 174; id., Add. Fish. Faun. N.S.W. (Fish Dept., N.S.W.), 1907, p. 15; Cockerell, Mem. Qld. Mus., ii, 1913, p. 56. (? Not *T. jarbua* Forskal.)

#### CRESCENT PERCH.

D. xi i 10; A. iii 8-9; P. 13; V. i 5; C. 17. 91-99 scales above the lateral line between its origin and the hypural joint, and 85-95 below it; 14-15 scales between the lateral line and the middle of the spinous dorsal fin. Cheek-scales in 8-10 rows.

Proportions of two specimens 108 and 183 mm. long:—Depth 2.6-2.9 in the length to the hypural joint; head 3.03-3.1 in the same. Eye 3.7-4 in the head, subequal to the length of the snout and the interorbital width, which are 3.7-3.8 and 3.5-4 in the head. Fifth dorsal spine 1.5, first dorsal ray 1.7-2.08, and third anal spine 2.7 in the head.

Body ovate, compressed. Cranium with a few obscure bony ridges posteriorly. Preorbital serrated. Preoperculum denticulate on its hinder and lower margins, with short spines on the rounded angle. Lower opercular spine enlarged, produced beyond the opercular lobe. Suprascapular bone exposed, smooth or serrated; coracoid denticulate. Fifth dorsal spine longest, much higher than the anterior rays; the last spine is much longer than the penultimate one. Second and third anal spines subequal.

Body with three dark longitudinal bands which are curved downward; the first extends from the origin of the spinous dorsal to that of the soft; the second from the nape to the upper surface of the caudal peduncle, and touching the lateral line; the third from the occiput to the middle of the caudal peduncle. The latter extends along the median caudal rays, and there are two oblique bars on either side of it; the upper lobe of the caudal is also tipped with black. A very large black blotch on the spinous dorsal between the fourth and eighth spines, and a small one may be present on the posterior spines; soft dorsal with two black spots.

This diagnosis is based on four Australian specimens, 108-183 mm. long.

Jordan & Thompson (*loc. cit.*) have recorded differences between specimens from various localities of the widely distributed *T. jarbua*, which, they suggest, may represent distinct species. Such material as is available to us bears out their observations, the Australian specimens having smaller and more numerous scales than others from the Philippine Islands and Samoa, but in the absence of a good series from several localities we are unable to add anything to their remarks. As noted by them,



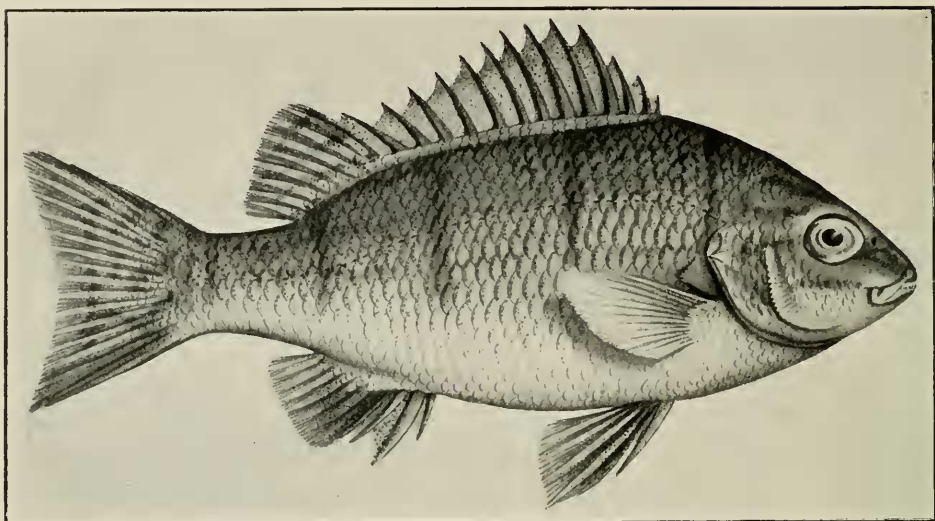


Fig. 1.—THERAPON PERCOIDES Günther. ♂ Nat. Size.

A. R. McCulloch, del.

Page 105.

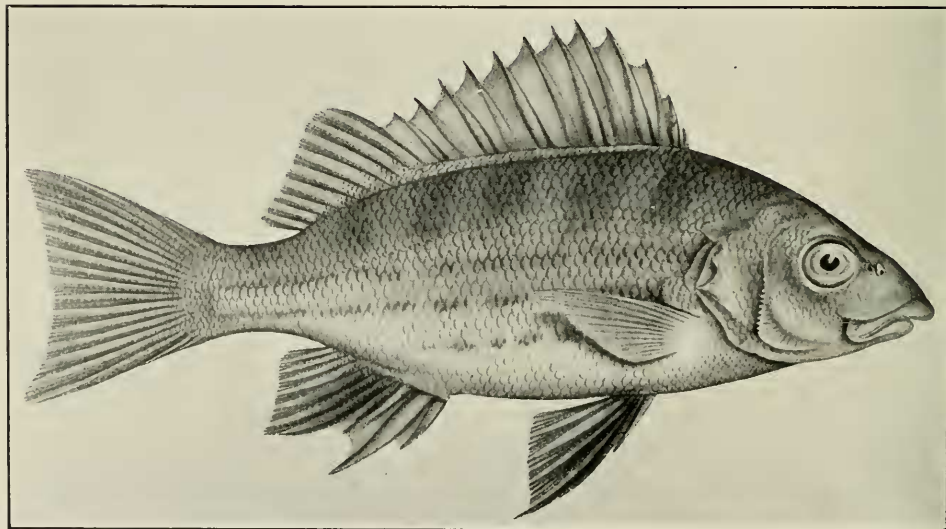


Fig. 2.—THERAPON INTERRUPTUS Macleay. ♂ Nat. Size.

A. R. McCulloch, del.

Page 114.



the Australian specimens agree with Japanese examples in their color-marking and scale-counts, and are therefore identical with *T. servus* Bloch, which was originally described from Japan.

*Locs.*:—Queensland, from north to south; Mapoon, Gulf of Carpentaria; Darnley Island; Edgecumbe Bay; Hervey Bay; Great Sandy Strait; Moreton Bay; Brisbane River; Nerang Creek; Port Darwin, North Australia. Western Australia.

#### THERAPON PERCOIDES Günther.

- Therapon percoides* Günther, Ann. & Mag. Nat. Hist. (3) xiv, Nov. 1864, p. 374; id., *ibid.*, xx, 1867, p. 58; Macleay, Proc. Linn. Soc. N. S. Wales, v, 1881, p. 362; id., *ibid.*, vii, 1882, p. 69; id., *ibid.*, viii, 1883, p. 201; Weber, Zool. Forsch., v, 1893, p. 262; Zietz, Narrat. Horn Exped. Centr. Austr., ii, 1896, Zool., p. 177, pl. xvi, fig. 1; Bancroft, Proc. Roy. Soc. Queensl., xxiii, 1912, p. 255.
- Dania fasciata* Steindachner, Sitzb. Akad. Wiss. Wien, lvi, i, 1867, p. 322.
- Therapon fasciatus* Castelnau, Res. Fish. Aust., 1875, p. 11; id., Proc. Linn. Soc. N. S. Wales, ii, 1878, p. 228; id., *ibid.*, iii, 1878, p. 46; Macleay, *ibid.*, v, p. 363; id., *ibid.*, vii, p. 69; Lucas, Proc. Linn. Soc. N. S. Wales, xix, 1894, p. 362.
- Therapon terræ-reginæ* Castelnau, *ibid.*, ii, pt. 3, May 1878, p. 227; id., *ibid.*, iii, 1878, p. 46; Macleay, *ibid.*, v, 1881, p. 363; id., *ibid.*, vii, 1882, p. 69.
- Therapon spinosior* de Vis, Proc. Linn. Soc. N. S. Wales, ix, pt. 2, 19 Aug., 1884, p. 397.

#### BLACK-STRIPED GRUNTER.

(Plate X, fig. 1.)

*Type localities*:—Fitzroy River near Rockhampton, M.Q. (*T. percoides*).  
Port Jackson, N.S.W., by a mistake (*D. fasciata*).  
Swan River, W.A. (*T. fasciatus*).  
Fitzroy River, probably (*T. terræ-reginæ*).  
Queensland (*T. spinosior*).

Body ovate to subovate, the dorsal contour considerably more arched than the ventral, its width 1.9 to 2.33 in its depth, which is 2.25 to 2.65 in its length and from one fifth to four ninths longer than the head; caudal peduncle usually a little longer than deep, its least depth 7.5 to 8.33 in the body length. Head about two ninths longer than deep, its upper profile linear or feebly rounded to above the posterior third of the eye, beyond which it merges into the occipito-nuchal convexity, its width 1.4 to 2 in its length, which is 3 to 3.33 in that of the body. Snout obtuse and narrowly rounded anteriorly, its length 2.8 to 3.35 in that of the head. Eye large, its diameter from one seventh more to two ninths less than the length of the snout and 1.25 to 1.5 in that of the postorbital head; interorbital region flat or feebly convex, its width 1.1 to 1.5 in the length of the snout. Maxillary not extending to the vertical from the anterior border of the eye. Preorbital strongly denticulated in the young, becoming rugose or even smooth in the adult; preopercle broadly rounded, the angle rather coarsely serrated, the serræ decreasing in size on the hinder limb and disappearing on the lower; opercle with two flat spines, the lower the longer; post-clavicle strongly denticulated; humeral concealed.

Jaws with a band of villiform teeth and an outer series of much enlarged conical approximate movable teeth, the tips of which are recurved; they decrease in size gradually from the front so that some of the posterior ones scarcely exceed or equal the inner teeth; tips of all the teeth chestnut-brown.

Scales in 40 to 42 (37 to 43) series above the lateral line, and 33-39 below it; 6, rarely 7, 1/14 or 15 scales in the series extending obliquely backwards from the base

of the 1st dorsal spine,  $4\frac{1}{2}$ -5 between the lateral line and the middle of the spinous dorsal fin. Cheek-scales in 4, rarely 5 series.

Dorsal fin with xiii rarely xiv 9, rarely 8 or 10, rays, originating above the pectoro-ventral interspace, the length of the soft portion 2.5 to 3 in that of the spinous, which is high, the spines rather slender with flexible tips, the first less than a fifth of the 5th, which is the longest, 1.5 to 1.9 in the length of the head; beyond this the spines decrease rapidly to the penultimate, which is shorter than the last; soft dorsal rounded, the anterior rays the longest, a little shorter than its base, and from one sixth to two fifths shorter than the longest spine. Caudal fin emarginate, with the lobes obtusely pointed, the middle rays 4.8 to 5.33 in the body-length. Anal fin with iii 8, rarely 7, rays, the last divided to the base; spines long and strong, the 1st about five ninths of the 2nd, which is stronger and from one tenth to one third longer than the 3rd, 1.5 to 2.1 in the length of the head, and as long as to two ninths more than the longest ray; soft fin similar to but much shorter than the soft dorsal, its length 1.2 to 1.75 in its height. Pectoral obtusely pointed, with 15 rays, the 5th the longest, its length 4 to 4.8 in that of the body. Ventral originating well behind the pectoral base, pointed, the spine long slender and flexible, 1.33 to 1.66 in the fin to the tip of the 1st ray, which is slightly produced, usually somewhat longer than the pectoral, 1.2 to 1.5 in the length of the head, and extending to midway between its origin and the posterior anal rays or further.

Gill-rakers 5 or 6+11 or 12, short and moderately slender, the longest about 4.5 in the eye-diameter.

Upper surface dark blue-gray, gradually shading on the sides into the pearly white of the lower surface, the scales above the lateral line with a darker border, those below darkest basally with an increasingly widening lighter border; back and sides with five black vertical bands two scales wide, the first from the nape to the opercle, the second and third below the spinous dorsal, the fourth below the soft dorsal, and the fifth upon the peduncle. Checks and vertical limb of preopercle gray with a faint tinge of yellow, the former with a median horizontal blue bar; lower surface of head white. Spinous dorsal colorless; soft with one or two rows of dusky spots, the basal row always present. Caudal with numerous blue spots on the proximal two thirds and the lower rays uniform dark blue-gray with a narrow white border. Anal clouded, with a broad lighter border. Pectorals colorless, as also are the ventrals, except the middle of the two outer rays which is dusky. (*πέρκη*, *perēh*; *είδος*, like.)

The above description has been drawn up after a critical examination of 23 fine examples from various localities. Of these 6 belong to the Old Collection of the Queensland Museum and though faded are in perfect condition; they were presented by Mr. W. N. Jaggard of Roekhampton, by whom they were obtained from the Fitzroy River in the vicinity of that city, and are therefore, practically topotypes of Günther's species: For 10 others we are indebted to Dr. T. L. Baneroff of Eidsvold on the Burnett River, who spared no pains in his endeavour to capture and send them with as little delay as possible; for 3 others from Eureka Creek, Stannary Hills, we have also to thank the same indefatigable collector. The other 4 are preserved in the Australian Museum, and came from the Barron River near Cairns, and from the Flinders River at Hughenden and Richmond. The description is therefore based on 17 specimens from rivers flowing towards the east, and 6 from those flowing westwards.

*Remarks*:—While there can be no doubt that the four names included in the synonymy belong to the same fish, this species, as is the case with so many freshwater forms of wide distribution, shows infinite variation as regards individuals from

different rivers, the inhabitants of one stream having in the course of ages of isolation developed certain small but constant peculiarities, which serve to distinguish them from those of the neighboring watercourses. For instance, the fishes examined from the Upper Burnett differ from those of the Lower Fitzroy as follow, taking the average of all the specimens from either locality :—

Width of body 2 in its depth ; depth of body 2·53, of caudal peduncle, which is longer than deep, 8, of pectoral fin 4·6 in length of body ; length of snout 3, diameter of eye 3·4, width of interorbit 4·14, longest dorsal spine 1·75, longest anal 2 in length of head ; base of soft anal 1·6 in its height . . . . . *Specimens from the Upper Burnett.*

Width of body 2·25 in its depth ; depth of body 2·4, of caudal peduncle, which is deeper than long, 7·33, of pectoral fin 4·2 in length of body ; length of snout 3·23, diameter of eye 3·2, width of interorbit 3·85, longest dorsal spine 1·55, longest anal 1·8 in length of head ; base of soft anal 1·35 in its height . . . . . *Specimens from the Lower Fitzroy.*

From none of the other rivers have we a sufficiently large series to permit of generalization, but a pair of fine specimens from the Upper Flinders and Eureka Creek show that these northern mountain forms are even thicker and more slender fishes in comparison with those from the Burnett, their proportions, adhering to the sequence given above, being 1·83 ; 2·7, 7·5 (though the peduncle is considerably longer than deep) and 4·3 ; the snout even longer, the eye even smaller, the interorbit even narrower, and the anal spine even lower, the measurements being 2·9, 3·55, 4·42, and 2·12.

*Historical*.:—This pretty little species was originally described by Günther from “two examples obtained in the Fitzroy River near Rockhampton,” sent to the British Museum by Krefft. Three years later Steindachner, under the name *Datnia fasciata*, described a fish, which was alleged to have come from Port Jackson, and which Günther<sup>2</sup> identifies with his *Therapon percoides*, adding the comment “This species comes from Queensland and not from Port Jackson.” After a further lapse of eight years Castelnau, quite independently of Steindachner, described as *Therapon fasciatus* a specimen of the same fish from Swan River, W.A. One of Castelnau’s original specimens is preserved in the Australian Museum. It is dried and somewhat damaged, but does not differ in either structure or color-marking from examples of *T. percoides* of the same size from the Burnett River, Queensland. Only another three years had passed when the same author again described Günther’s species as *Therapon terræ-reginæ* from a small example “taken in one of the northern rivers of Queensland, probably the Fitzroy.” In this article he refers to a “Brisbane Museum specimen six inches long from the same river,” and incidentally mentions that he believes that his *T. fasciatus* is “confined to the Western Coast of Australia.” In the following year, however, he claims to have found several of these fishes in “Mr. Gulliver’s collection from the Norman River,” but the characters relied on in that paper are those of a typical *percoides*. Macleay, who considered *fasciatus* to be “a very distinct species,” records it from the Palmer River, a mountain tributary of the Mitchell, on the authority of specimens collected by Tenison-Woods, and remarks that it “seems to be confined to the rivers flowing into the Gulf of Carpentaria,” entirely overlooking the fact that it was originally described from West Australia. Lucas as *T. fasciatus* and Zietz more correctly as *T. percoides* record the species from streams (Palm and Red Bank Creeks) flowing through the McDonnell Ranges, Central Australia, thus bridging over the space between the eastern and western zones of distribution. Lucas is the first writer to use the preorbital and preopercular denticulations as a means of distinguishing *T. fasciatus* from *T. percoides*, but he surely could never have read Günther’s description nor Macleay’s copy of it before committing such a blunder.

<sup>2</sup> Zool. Rec., iv, 1867, p. 159.



*Uses* :—This species, which is known as “grunter” among the Burnett anglers, greedily takes any flesh bait in the daytime ; it is a game little fellow, but is usually considered too small for the table, as it rarely exceeds a quarter of a pound in weight, nevertheless the flesh, what there is of it, is equally as good as that of its congeners. (*Bancroft in lit.*)

*Dimensions* :—Attains a length of 150 millim.

*Range* :—Although this grunter is principally known as a Queensland species it is probable that it occurs in suitable localities throughout intertropical and juxta-tropical Australia. Within the boundaries of the home State it has been taken in the Burnett River (*Bancroft*), Fitzroy (*Günther*), Barron and Flinders (*Austr. Mus.*), Norman (*Castelnau*), Hodgkinson (*Lucas*), Walsh (*Bancroft*), and Palmer (*Macleay*), while beyond our limits it has been recorded from the McDonnell Ranges (*Zietz*), and Swan River (*Castelnau*).

*Illustration* :—Our illustration is taken from one of the specimens kindly forwarded to us by Dr. Bancroft.

#### Therapon caudavittatus Richardson.

*Datnia? caudavittata* Richardson, Voy. Erebus and Terror, Fishes, 1845, p. 24, pl. xviii, fig. 3-5.

*Therapon caudovittatus* Günther, Cat Fish. Brit. Mus., i, 1859, p. 284; id., Ann. Mag. Nat. Hist. (3) xx, 1867, p. 58; id., Voy. Challenger, Zool., i, 1880, Shore Fishes, p. 39; Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 1877, p. 270; Macleay, Proc. Linn. Soc. N. S. Wales, ii, 1878, p. 348; id., ibid., v, 1881, p. 361; Castelnau, Proc. Linn. Soc. N. S. Wales, iii, 1878, pp. 42 and 47; Klunzinger, Sitzb. Akad. Wien, lxxx, i, 1879, p. 350; Waite, Rec. Austr. Mus., iii, 1900, p. 210; McCulloch, Rec. W. Austr. Mus., i, 1912, p. 88.

*Therapon caudovittatus vel bostockii* Castelnau, Proc. Zool. Soc. Viet., ii, 1873, p. 128.

D. xiii 8-9; A. iii 8; P. 14-15; V. i 5; C. 17. 52-56 series of scales above the lateral line between its origin and the hypural joint, and 44-49 below it; 6-7½ scales between the lateral line and the middle of the spinous dorsal fin. Cheek-scales in 9-10 rows.

Proportions of a specimen 196 mm. long :—Depth 2.8 in the length to the hypural joint; head 3.3 in the same. Eye equal to the interorbital width, 4.5 in the head and 1.6 in the snout. Snout 2.7 in the head. Fifth dorsal spine 1.8, anterior dorsal ray 2.1, and second anal spine 2.5 in the head.

Body compressed, the dorsal profile a little more arched than the ventral. Interorbital ridges well developed, those of the cranium weak. Maxillary reaching to below the nostrils or the anterior orbital margin. Preorbital more or less serrated. Preoperculum evenly and finely serrated. Lower opercular spine well developed, not or scarcely projecting beyond the opercular lobe. Suprascapular hidden beneath the skin and scales: coracoid denticulate. Fifth dorsal spine longest, higher than the rays; the last spine is shorter than the penultimate one. Second anal spine longer than the third.

*Color in formaline* :—Violet grey on the back, lighter on the sides, and white below; the upper parts and the sides are closely spotted with round greyish spots. Dorsal fin similarly spotted, the soft portion with a blackish margin. Caudal more or less spotted basally, each lobe with a large black blotch extending obliquely across it.

We have a good series of specimens 127-196 mm. long which exhibit very little variation.

*Locs.* :—Fremantle, Western Australia; Torres Strait; Murray Island, Torres Strait; Gulf of Papua; Dutch New Guinea.





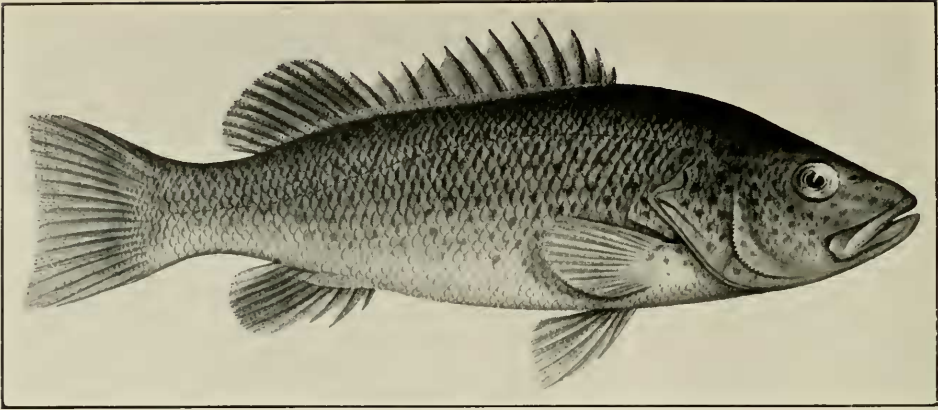


Fig. 1.—THERAPON UNICLOR Günther.  $\frac{5}{8}$  Nat. Size.  
A. R. McCulloch, del.

Page 109.

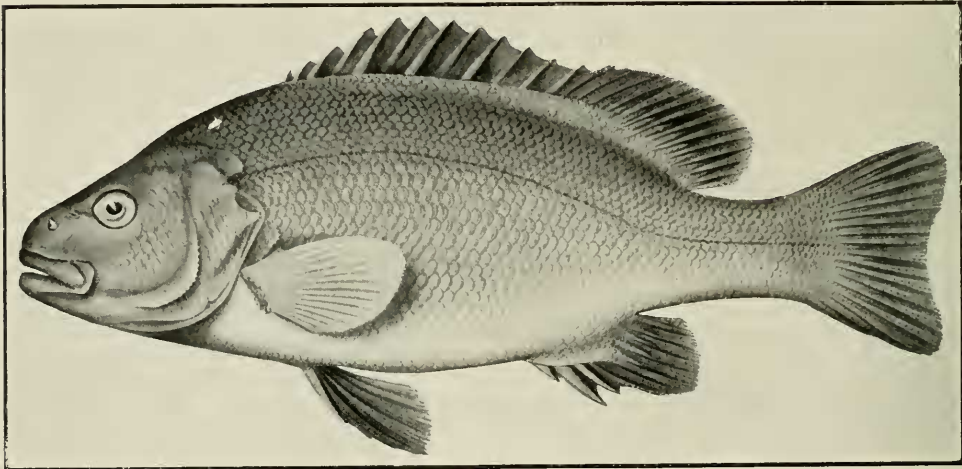


Fig. 2.—THERAPON BANCROFTI Ogilby & McCulloch.  $\frac{1}{2}$  Nat. Size.  
A. R. McCulloch, del.

Page 119.

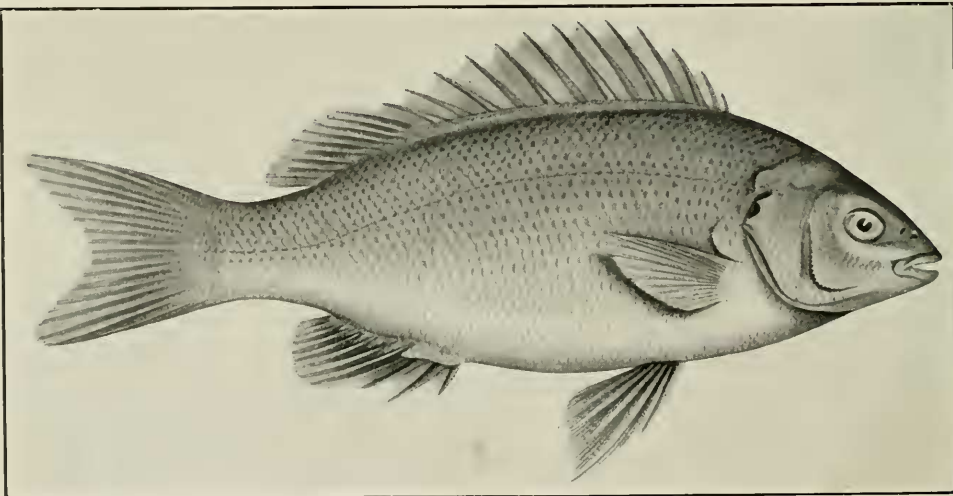


Fig. 3.—THERAPON PARVICEPS Macleay.  $\frac{5}{8}$  Nat. Size.  
A. R. McCulloch, del.

Page 123.

*Distribution* :—This species has been recorded from the following localities :—Western Australia ; Harvey River (*Richardson*) ; Fremantle (*Castelnau, Waite, and McCulloch*). North Australia : Port Essington (*Günther*) ; Port Darwin (*Macleay*). Queensland : Somerset and Cape York (*Günther*) ; Norman River, Gulf of Carpentaria (*Castelnau*) ; Port Denison (*Klunzinger*). Torres Strait (*Macleay*). Murray Island (*McCulloch*). Darnley Island (*Tosh*) ; Gulf of Papua (*Macleay*). Moreton Bay (*Queensland Museum, O.C.*)

**THERAPON UNICOLOR** Günther.

(Plate XI, fig. 1.)

*Therapon unicolor* Günther, Brit. Mus. Catal. Fish., i, 1859, p. 277 ; Macleay, Proc. Linn. Soc. N. S. Wales, iii, 1878, p. 15 ; Günther, Zool. Challenger, i, 1880, Shore Fish., p. 32 ; Macleay, *ibid.*, v., 1881, p. 266 (*after Günther*) ; Woods, Fish and Fisher. N. S. Wales, 1882, p. 15 ; Ogilby, Catal. Fish. N. S. Wales, 1886, p. 11 ; Stead, Proc. Linn. Soc. N. S. Wales, xxxiv, 1909, p. 116.

? *Datnia brevispinis* Steindachner, Sitzb. Akad. Wiss. Wien, lvi, i, 1867, p. 309.<sup>3</sup>

*Therapon truttaceus* Macleay, *ibid.*, v, pt. 3, Feb., 1881, p. 366 ; Zietz, Zool. Horn Exped., ii, 1896, p. 176.

*Therapon longulus* Macleay, *ibid.*, p. 367.

*Therapon elphinstonensis*, de Vis, Proc. Roy. Soc. Queensl., i, May, 1885, p. 57.

*Therapon unicola* Kent, Great Barrier Reef, 1893, p. 369.

*Therapon unicolor* Waite, Synops. Fish. N. S. Wales, 1904, p. 33.

*Therapon idoneus* Ogilby, Proc. Roy. Soc. Queensl., xx, 15 Oct., 1907, p. 37.

*Therapon truttaceus* Waite, Trans. Roy. Soc. S. Austr., xxxviii, 1914, p. 446.

SPANGLED GRUNTER.

*Type localities* :—Gwydir River N.S.W. (*T. unicolor*).

Endeavour River, N.Q. (*T. truttaceus*).

Freshwaters inland from Port Darwin, N.T. (*T. longulus*).

Lake Elphinstone, M.Q. (*T. elphinstonensis*).

Upper Condamine River, S.Q. (*T. idoneus*).

Body elliptical or elongate-elliptical, the dorsal and ventral contours symmetrical or the former a little more arched, its width 1.5 to 1.9 in its depth, which is 2.75 to 3.5 in its length and from one twelfth more to one fourth less than the length of the head ; caudal peduncle as long as to two fifths longer than deep, its least depth 7.5 to 10 in the body-length. Head about four ninths longer than deep, its upper profile linear or feebly concave, that of the nape gently rounded, its width 1.5 to 2 in its length, which is 2.7 to 3.2 in the body-length. Snout broadly rounded, its length 3.1 to 3.66 in the length of the head ; lips moderate. Eye rather small, its diameter 1.15 to 1.75 in the length of the snout and 2 to 2.6 in the postorbital head ; interorbital region flat or feebly convex, its width 1.25 to 1.66 in the length of the snout. Maxillary extending to the vertical from the anterior border of the eye or even to that of the pupil. Preorbital entire or with a few coarse denticles posteriorly ; hinder limb of preopercle serrated, the serræ disappearing on the broadly rounded angle ; opercle with a short, stout pungent spine, above which is a more or less blunt point ; post-clavicle with some coarse denticles.

Jaws with a broad band of villiform teeth and an outer series of enlarged fixed teeth, which are separate and somewhat recurved ; roof of month toothless.

<sup>3</sup> *Datnia brevispinis* Steindachner has been briefly described from Cape York. Such characters as are given agree with those of *Therapon unicolor* Günther, with which Steindachner's species is probably identical.

Scales in 48 to 56 series above, 44 to 52 below the lateral line ; 8 or 9/1/18 to 21 scales in the series extending obliquely backwards from the base of the first dorsal fin ; cheek-scales in 8 or 9 series below the middle of the eye. Lateral line tubes 46 to 51.

Dorsal fin with xii (rarely xi or xiii) 10 (rarely 9 or 11) rays, originating above the pectoro-ventral interspace, the length of the soft portion 2 to 2.25 (1.9 to 2.4) in that of the spinous, which is low, with the spines rather weak and flexible, the 1st short, about one third of the 5th, which is usually a little longer than the 4th or 6th, its length 2.85 to 3.4 in that of the head ; beyond these the spines are finely graded to the penultimate, which is about one sixth shorter than the last ; soft dorsal rounded, the 2nd and 3rd rays longest, 1 to 1.25 in its base and one fifth to two fifths more than the longest ray. Caudal fin truncate or feebly emarginate with the angles rounded, the middle rays 5 to 5.6 (4.75 to 6) in the body-length. Anal with iii 8, sometimes 7 or 9, rays, the last divided to the base ; spines short and stout, the 2nd or 3rd longest, 3 to 4 in the length of the head and 1.3 to 1.7 in the longest ray ; soft fin similar to but much shorter and usually a little higher than the soft dorsal, its length 1.3 to 1.7 in its height. Pectoral rounded, with 15, rarely 14 sometimes 16, rays, its length 5 to 5.6 in that of the body. Ventral fin originating well behind the pectoral base, rounded, the spine short and flexible, less than half the length of the 2nd ray, which is usually longer than the pectoral, 1.5 to 2 in the length of the head, and extending to midway between its origin and the 1st anal spine or 2nd ray.<sup>4</sup>

Gill-rakers 5 or 6+11 or 12, short and stout, the longest 3 to 3.33 in the eye-diameter.

Blue-gray, each scale with a dark brown or purplish border, which almost, or in large examples wholly, conceals the ground color above the lateral line, but grows gradually narrower and fainter down the sides, where each scale has a central golden or bronzy spot, and finally merges in the ground color, which itself passes insensibly into the white or yellowish white of the lower surface. Soft dorsal brown with a paler marginal band ; anal spines and anterior ray and usually the lower caudal rays white, the other fins colorless. (*unicolor*, of one color. A most unfortunate name for this handsome fish.)

In the preparation of the above description we have examined 64 picked specimens from the following localities :—Burnett River at Eidsvold collected by Dr. T. Bancroft (14) ; Fitzroy River at Rockhampton, Mr. W. N. Jaggard (10) ; Inkerman (1) and Cromarty (3) both in the Townsville District ; Lake Elphinstone, Dr. Ling Roth (3), types of *T. elphinstonensis* ; Eureka Creek, Stannary Hills, Dr. T. Bancroft (12) ; Norman River at Normanton, Dr. C. Taylor (2) ; Gregory River, Dr. T. Bancroft (3) ; Alice River at Barcaldine (10) ; Lagunes in Ryan's Paddock near Goondiwindi, Mr. J. Lamb (4) ; and Condamine River, Messrs. M. Colclough (1) and Mr. White (1), the latter being the type of *T. idoneus*.

*Remarks* :—Although, as might be expected in a freshwater fish inhabiting so vast a territory, and living under so many and diverse conditions, the individual variation is very great, we have not found that these differences are confined to certain fixed areas, but occur indiscriminately wherever the species exists.

<sup>4</sup> An analysis of the fin variation in the 64 examples critically examined gives the following results :—

D. xi 10 (1) ; xii 9 (4) ; xii 10 (47) ; xii 11 (10) ; xiii 11 (2).

A. iii 7 (9) ; iii 8 (43) ; iii 9 (12).

P. 14 (1) ; 15 (52) ; 16 (11).



*Historical*:—This handsome grunter was first described by the late Dr. Albert Günther, more than half a century ago, from specimens sent to the British Museum from the "Head of Mosquito Creek near Darling Downs"—a South Queensland locality which we have failed to identify—and the Gwydir River, N.S.W. These specimens, as is always the case when they have been for some time in a preservative, had lost their distinctive color-markings, and become "grayish, each scale with a darker margin"; consequently they were encumbered with the inappropriate name by which they are now known. Some twenty years later Macleay identified certain small fishes, forwarded to him from a recently filled dam at Warialda, in the Gwydir District, as belonging to this species, and accounted for their presence in an outlying dam, "which had been dry a few months back," on the hypothesis that the ova had been conveyed from more permanent waterholes "adhering to the feathers of ducks or other aquatic birds." We think that the size of these fishes, given as "about four inches," militates against this theory, for such fishes are of slow growth and could hardly attain to such a length in so short a time and in such a limited space. We are more inclined to believe it to be an ordinary case of suspended animation in individuals, which had buried themselves in the mud when the water in the dam had sunk so low as to leave them exposed to their many enemies. In his Report on the Shore Fishes of the Challenger Expedition Günther made an important addition to its distribution, being able to record it from the "River Mary near the village of Tiaro," thus bringing it across to the eastern slope of the Dividing Range. In 1881 Macleay in his Catalogue, while adding nothing to the known distribution of *T. unicolor*, described as new two more species of freshwater *Therapon* under the names *T. truttaceus* and *T. longulus*,<sup>5</sup> the former from the Endeavour River, N.Q., the latter from "freshwaters inland from Port Darwin," N.T. Both of these we believe to be inseparable from Günther's fish. *T. truttaceus* was subsequently recorded by Zietz from specimens obtained by the Horn Expedition in Red Bank Creek, Finkle River, Palm Creek, and Walker's Gorge, and some years later Waite endorsed Zietz's identification from the examination of specimens collected in the same district by Mr. S. A. White's expedition into the interior. About four years after the publication of Macleay's new species de Vis received from Dr. Ling Roth some small fishes which he had obtained in Lake Elphinstone, a turbid sheet of water, some six miles long by two wide, lying landlocked between the watersheds of the Nebo and Suttor Rivers, inland from Mackay, M.Q. These he considered to be undescribed, and named them after their place of origin, stating, however, that they were nearly allied to *T. longulus* Macleay. An examination of the types shows no characters of sufficient value to separate them from *T. unicolor*. Finally the senior author, having received from Mr. D. O'Connor a fine *Therapon*, collected by Mr. White in the Upper Condamine, described it as *T. idoneus*, while noting its relationship to Macleay's and de Vis' species above referred to. He also gave an interesting account of the way in which these fishes sometimes appear by myriads in creeks where they were previously unknown, and after remaining for some time disappear with the same suddenness as marked their advent.

Some years ago Stead exhibited before the Linnean Society of New South Wales certain fishes, which were said to have come up through an artesian bore from a depth of 943 feet at Corella, in North-Western New South Wales. These he identified with *T. unicolor*. It was remarked that in most of these specimens the eye was damaged, or in some cases entirely absent, and from this circumstance the opinion was expressed that the fishes did not live and breed in the subterranean waters, but had individually found their way thither.

<sup>5</sup> We have examined the type of *T. truttaceus* which is preserved in the Macleay Museum. The typical specimen of *T. longulus* appears to have gone astray.

The protrusion of the eyeball in fishes, a disease commonly known as "Pop-eye," has formed the subject of a very valuable paper by Professor C. Coleridge Farr.<sup>6</sup> His investigations, which were based on the eggs and young of trout in the Canterbury artesian water system, practically proved that the eyes protruded as a result of excessive gas contained in the water, and he expressed the opinion that the effect was identical with that observed in the Corella bore fishes. Under these circumstances, we see no reason to accept Mr. Stead's suggestion that these fish came up the bore, but assume that they were merely aestivating somewhere in its vicinity, and upon being again vivified by the bore water, came under the influence of its contained gases and so developed pop-eye.

*Uses* :—Though rather small for general table use this species attains a weight of half a pound, and is of good flavor as a pan-fish, while with a light rod and the finest tackle it gives fair sport, fighting gamely for its life when hooked.

*Range* :—This fish is very widely distributed throughout subtropical and tropical Australia, being found practically everywhere from lat. 30° S. northward to Cape York and westward to at least the upper waters of the Murchison, whence the late Mr. Alexander Morton brought two small specimens many years ago. Specimens are in the Australian Museum from King Sound, North-Western Australia, which were collected by Mr. J. Cairn in 1886.

*Illustration* :—Our figure is taken from a fine specimen collected by Dr. Thomas Bancroft at Eidsvold on the Burnett.

#### Therapon bidyana Mitchell.

##### SILVER PERCH.

- Acerina (Cernua) bidyana* Mitchell, Three Exped. Int. Eastern Austr., i, 1838, p. 95, pl. viii.  
*Datnia elliptica* Richardson, Zool. Erebus and Terror, Ichth., 1848, p. 118, pl. lii, fig. 4-8.  
*Therapon ellipticus* Günther, Brit. Mus. Cat. Fish., i, 1859, p. 276; Klunzinger, Arch. für Naturg., xxxviii, i, 1872, p. 21; id., Sitzb. Akad. Wiss. Wien, lxxx, i, p. 350; Castelnau, Proc. Zool. Soc. Viet., ii, 1873, p. 127; Macleay, Proc. Linn. Soc. N. S. Wales, v, 1881, p. 363; Ogilby, Ed. Fish. N. S. Wales, 1893, p. 28, pl. vi; Waite, Rec. Austr. Mus., iii, 1900, p. 210.  
*Therapon ellipticus* Waite, Mem. N. S. Wales Nat. Club, No. 2, 1904, p. 33; Stead, Ed. Fish. N. S. Wales, 1908, p. 73, pl. xlii.  
*Therapon nigrum* Castelnau, Proc. Zool. Soc. Viet., i, 1872, p. 59; id., ibid., ii, 1873, p. 38; Macleay, ibid., p. 365; id., ibid, ix, 1884, p. 12; Ogilby, Cat. Fish. N. S. Wales, 1886, p. 11; Lucas, Proc. Roy. Soc. Viet. (2), ii, 1890, p. 19.  
*Therapon richardsoni* Castelnau, Proc. Zool. Soc. Viet., i, 1872, p. 60; Macleay, ibid., p. 364; Ramsay, Proc. Linn. Soc. N. S. Wales, vi, 1882, p. 832; Ogilby, ibid., p. 11; Lucas, ibid.; Kent, "Gt. Barrier Reef," 1893, pp. 282, 369.  
*Therapon macleayana* Ramsay, Proc. Linn. Soc. N. S. Wales, vi, 1882, p. 831; Macleay, ibid., ix, 1884, p. 12; Ogilby, ibid., p. 12.  
*Therapon bidyana* McCulloch, Rec. Austr. Mus., ix, 1913, p. 359; id., Proc. Linn. Soc. N. S. Wales, xl, 1915, p. 262, pl. xxxvi, fig. 1.

D. xii 12-13; A. iii 8-9; P. 17; V. i 5; C. 17. 75-89 scales between the origin of the lateral line and the hypural joint counted below the lateral line, and 82-92 above it; 13-14 between the lateral line and the middle of the spinous dorsal. Cheek-scales in 8-10 rows.

<sup>6</sup> Coleridge, Rept. 13th Meeting Austr. Assn. Adv. Sci., 1911 (1912), p. 354.

Depth 3·3·2 in the length to the hypural joint ; head 3·3·3·5 in the same. Eye 4·5·4·6 in the head, 1·3 in the snout, which is 3·4 in the head. Sixth dorsal spine 1·8, first dorsal ray 2·2·2, second anal spine 1·6·2·1, and pectoral fin 1·6 in the head.

Body slender in the young, deeper in adults. Head rather small. Snout obtusely pointed, jaws equal. Maxillary almost reaching to below the anterior margin of the eye, its hinder portion exposed. Eye of moderate size, shorter than the snout ; interorbital space nearly flat, with feebly developed bony ridges ; its width is a little greater than the length of the snout. Nostrils about their own diameter apart, with raised skinny margins, the anterior with a small lobe. Preorbital strongly serrated. Preoperculum with rather strong teeth which are largest on the rounded angle. Two flat opercular spines, each of which is often double ; the lower is the larger, not reaching beyond the opercular lobe. Scapula and suprascapula denticulate.

Each jaw with a row of cardiform, partly depressible teeth externally, followed by a band of villiform ones. Vomer toothless, the skin surrounding it with a number of minute papillæ which resemble teeth but which are soft and free from the bone. Scales slightly enlarged on the anterior portion of the side, very small on the breast. They form the usual sheaths at the bases of the dorsal and anal spines, and extend up between the bases of the dorsal, anal, pectoral, and caudal rays.

Dorsal spines long and moderately strong, the fifth and sixth highest, and longer than the rays ; last spine not longer than the penultimate : rays decreasing evenly backwards, the posterior margin of the soft dorsal rounded. Second anal spine longer than the third, as long as or a little longer than the anterior rays ; margin of the soft anal obliquely truncate. Fifth upper pectoral ray longest, the hinder margin of the fin rounded. Ventrals inserted below the third or fourth dorsal spine, the anterior ray with a short filament, and reaching the vent in smaller specimens or not so far in larger ones. Caudal deeply emarginate.

Silvery, upper surfaces finely dotted with brown, each scale with a darker margin.

Described from four specimens, 199-282 mm. long. The young of this species differs greatly from the adult in being elongate, and in having the snout convex. It has been recently figured by McCulloch (*loc. cit.*), while the adult is illustrated by Stead (*loc. cit.*).

We are indebted to Mr. H. K. Anderson, of the Fisheries Department of New South Wales, for the following interesting notes on the habits and breeding of *T. bidyana* :—

“ The Silver Perch is one of the most plentiful and important fishes of the western waters of New South Wales, and occurs in large numbers in the Murray River and many of its tributaries. It inhabits clear running waters, and prefers to feed in the vicinity of eddies, breaking the surface like trout in quest of flies and other insects, borne along by the current. It usually attains a weight of five pounds, although much larger specimens have been taken. The Silver Perch is a good sporting fish, and were it better known to anglers, many who now confine themselves exclusively to trout-fishing, would spend some of their time in its quest. It is not generally known that Silver Perch will come readily to a trout-fly or a small spinner, though a whole shoal may be caught with one if the fisherman keeps out of sight and does not frighten them by causing an undue disturbance of the water. Nor must he let a hooked fish escape, or the whole shoal will immediately disappear, and may not show themselves again for a considerable time. I recently caught five fish, weighing from three pounds down to half a pound, from one shoal in half an hour on small



“cochy-y-bondhu,” and had excellent sport. They fought a rushing battle, and did not give in until practically dead. When playing in the water, or when freshly caught, Silver Perch frequently make a snorting sound which has earned for them the vernacular name ‘Grunter.’

“At spawning time, Silver Perch congregate in deep water under high banks, selecting a spot dimpled with eddies, where they usually remain within a few feet of the surface. Their eggs are demersal, and adhere to submerged roots and rushes, etc. In November, 1914, while sitting quietly on a bank near Darlington Point on the Murrumbidgee River, chance rewarded me with some little insight into their breeding-habits. A shoal of between fifty and seventy Silver Perch was playing in a series of eddies under a precipitous bank where the water was perhaps ten or twelve feet deep. Some were feeding at the surface, while others swam about, apparently aimlessly; a section of the shoal, comprising most of the larger fish, remained in a central position. It being well known that the majority of the larger fish of any species are females I assumed those in the centre to be spawning females, while the smaller fish swimming around them were ripe males. Suddenly, as though preconcerted, all the fish swam rapidly to the centre, splashing the water in all directions, and becoming hidden for an instant by its disturbed surface. Next moment the water around and below them assumed a white opaque tinge, as though a bucket of milk had been thrown in; this was clearly due to the extrusion of the milt of the male fishes. This operation was repeated five or six times at intervals of about twenty or thirty minutes while I watched, but soon after sundown the fish disappeared.”

#### Therapon humeralis Ogilby.

*Therapon humeralis* Ogilby, Proc. Linn. Soc. N. S. Wales, xxiv, 1899, p. 177; Waite, Rec. Austr. Mus., vi, 1905, p. 62, pl. ix.

D. xii-xiii 11; A. iii 10. Between eighty and ninety series of scales between the origin of the lateral line and the hypural joint, and fourteen to fifteen between the lateral line and the middle of the spinous dorsal. Depth 2.8-2.9 in the length to the hypural; head 3.3 in the same. Eye a little shorter than the snout, 3.7-3.8 in the head. Longest dorsal spine much longer than the rays, 1.6-1.7 in the head; the last shorter than the penultimate. Second anal spine a little longer than the third, but shorter than the anterior rays.

Upper surface of cranium with prominent ridges. Lower preopercular spine enlarged, but not projecting beyond the opercular lobe. Preoperculum armed with strong spines which are enlarged at the angle. Teeth in a band in each jaw, the outer row enlarged, conical, not cardiform; vomer and palatines toothless. Gill-rakers moderately elongate and numerous.

A broad dark shoulder-spot. Body with four dark cross-bars, the first incomplete, below the anterior dorsal spines, and the last on the caudal peduncle. Some dark bars and spots below and behind the eye. Soft dorsal, anal, and caudal fins with dark spots.

Loc. :—Houtmans Abrolhos, Western Australia; marine.

#### Therapon (Datnia) interruptus Macleay.

(Plate X, fig. 2.)

*Therapon interruptus* Macleay, Proc. Linn. Soc. N. S. Wales, viii, 1883, p. 258.

#### TAPIROID GRUNTER

D. xii 10; A. iii 8; V. i 5; P. 1-13; C. 17. 51-52 series of scales between the origin of the lateral line and the hypural joint counted below the lateral line, and 54-55 above it; 6-7½ between the lateral line and the middle of the spinous dorsal.



Depth 2·8-3 in the length to the hypural joint; head 2·8-2·9 in the same. Eye a little larger than the interorbital width, 3·9-4·1 in the head and 1·4-1·5 in the snout; snout 2·7 in the head. Fifth dorsal spine 1·6-1·8, anterior dorsal ray 1·8-2, second anal spine 1·7, and anterior anal ray 1·4-1·5 in the head.

Body compressed. Snout acute, the upper lip produced into a fleshy point; upper jaw overhanging the lower, which closes behind the premaxillaries. Maxillary extending backward to below the end of the first third or fourth of the eye; it is entirely covered by the posterior lobe of the upper lip. Eyes large. Nostrils close together, the anterior with a skinny lobe. Preorbital with a few small teeth posteriorly. Hinder margin of the preoperculum with moderately strong teeth which are largest above the rounded angle; lower margin entire. Operculum with two spines, the lower strong but not overlapping the opercular lobe. Teeth in a band in each jaw, the outer ones enlarged, cylindrical, and movable. Vomer either toothless or with about three median teeth; palatines toothless. Gill-rakers of the first gill-arch rather long and slender posteriorly, about sixteen on the lower limb.

Scales arranged as usual in the genus. They are larger on the anterior portion of the side, becoming smaller on the back, belly, and tail, and minute before the ventrals. There are about thirteen series on the cheeks, the lower ones being very small.

Dorsal spines strong, the fifth longest, and longer than the rays; the last is shorter than the penultimate one: soft dorsal a little emarginate. Anal fin originating behind the vertical of the last dorsal spine, and terminating in advance of the soft dorsal: the second spine is very long and strong, a little shorter than the anterior rays, and much longer than the third spine; soft anal pointed anteriorly. Pectoral pointed, the second upper ray longest. Ventral inserted below the fourth dorsal spine, the anterior ray with a short filament, reaching beyond the vent.

Silvery, with three longitudinal dark bands on each side below the lateral line which are more or less broken up into elongate blotches. Back with five broad dark cross-bands which run obliquely downward and backward. Fins without markings.

Described from two of Macleay's typical specimens, 171-182 mm. long. They differ from his description in several details, particularly in the proportions of the eyes, interorbital space, and snout, while the dorsal markings are oblique instead of vertical. They are allied to *Datnia argentea* Cuvier & Valenciennes.

*Loc.*:—Normanby Island, D'Entrecasteaux Group; fresh water.

**THERAPON (DATNIA) ARGENTEUS** Cuvier & Valenciennes.

- Datnia argentea* Cuvier & Valenciennes, Hist. Nat. Poiss., iii, 1829, p. 139, pl. liv; Day, Fish. India, 1875, p. 71, pl. xviii, fig. 7.  
*Mesopristes macracanthus* Bleeker, Nat. Gen. Arch. Ned. Ind., i, 1844, p. 523.  
*Datnia cancellatoides* Bleeker, Nat. Tijdschr. Ned. Ind., iv, 1853, p. 247.  
*Therapon argenteus* Günther, Brit. Mus. Cat. Fish., i, 1859, p. 283.  
*Therapon (Datnia) argenteus* Bleeker, Atlas Ichth., vii, 1876, p. 114. pls. ccxxvi, fig. 1, and ccxxxix, fig. 4.  
*Therapon nasutus* Macleay, Proc. Linn. Soc. N. S. Wales, vii, 1882, p. 258.  
*Therapon chalybeus* Macleay, *ibid.*, p. 259.  
*Therapon acutirostris* de Vis, Proc. Linn. Soc. N. S. Wales, ix, 1884, p. 398.

D. xii 10; A. iii 8-9; P. 13-14; V. i 5; C. 17. 52-55 series of scales below the lateral line between its origin and the hypural joint, and 55-58 above it; 6½-8 scales between the lateral line and the middle of the spinous dorsal fin. Cheek-scales in 8-9 rows.

Proportions of two specimens 122 and 262 mm. long. Depth 2.6-2.7 in the length to the hypural joint; head 2.7 in the same. Eye 3.3-4.3 in the head, shorter than the snout, and greater than the interorbital width. Snout 2.5-2.8, interorbital space 4.8-5.2 in the head. Fifth dorsal spine 1.4-1.7, first dorsal ray 1.6-1.7, second anal spine 1.4-1.9, and first anal ray 1.5 in the head.

Body elevated, compressed. Snout sharply pointed, the upper jaw the longer; the profile from its tip to the first dorsal spine is almost straight or slightly convex on the nape. Interorbital and cranial ridges well developed in the young, obsolete in adults. Preorbital bone serrated. Preoperculum more or less denticulate, the denticles enlarged on the rounded angle in young specimens. Lower opercular spine not produced beyond the opercular lobe. Suprascapular and coracoid bones exposed and more or less denticulate. Dorsal and anal spines very long and strong. The fifth dorsal spine is the longest, much longer than the rays in the young, subequal to them in adults; eleventh and twelfth spines subequal, or the last slightly the longer: soft dorsal rounded. Second anal spine longer than the third, as long as the rays in the young, shorter in adults: soft anal angular.

*Color in alcohol*:—Uniform dusky silver; the fin-membranes are somewhat darker, the anterior and posterior anal rays white. In the young there are three narrow longitudinal dark bars on the sides.

The above diagnosis is based on eight specimens 105-262 mm. long from various localities.

*Remarks*:—The typical specimens of *Therapon nasutus* Macleay are in the Australian Museum collection; they do not differ from the descriptions and illustrations of *T. argenteus* quoted above. *Therapon chalybeus* was also based on a young example of Cuvier and Valenciennes' species; the typical specimen, which is preserved in the Australian Museum, proves the proportions given by Macleay to be incorrect in several details. A young specimen from Queensland, received by the Australian Museum from the Queensland Museum in 1886, agrees very well with de Vis' description of his *T. acutirostris*, and is possibly a co-type of that species; it is also identical with *T. argenteus*.

*Locs.*:—We have examined specimens from the following localities:—Port Moresby, Papua; Normanby Island, D'Entrecasteaux Group, in fresh water; Santo and Eromanga, New Hebrides; Queensland.

#### THERAPON CARBO sp. nov.

(Plate XII, fig. 1.)

#### ROUND-TAILED GRUNTER.

*Type locality*:—Gregory River, N.Q.

Body ovate, the dorsal contour scarcely more arched than the ventral, its width 2 to 2.1 in its depth, which is 2.3 to 2.4 in its length and one fourth more than the length of the head; caudal peduncle deeper than long, its least depth 7.25 to 7.33 in the body-length. Head about one fourth longer than deep, its upper profile linear to above the hinder border of the eye, beyond which it merges into the occipitonothal convexity, its width 1.67 in its length, which is 2.85 to 3 in that of the head. Snout rather sharp and narrowly rounded in front, its length 3 to 3.15 in that of the head; lips rather thin. Eye moderate, its diameter 1.33 to 1.5 in the snout and 2 to 2.2 in the postorbital head; interorbital region feebly convex, its width but little less than the length of the snout. Maxillary extending to below the posterior nostril.

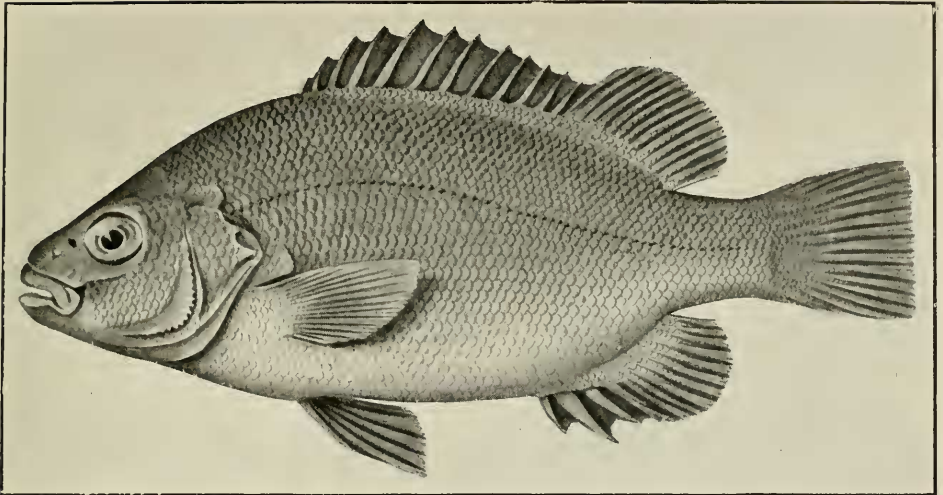


Fig. 1.—THERAPON CARBO Ogilby & McCulloch.  $\frac{5}{8}$  Nat. Size.

A. R. McCulloch, del.

Page 116.

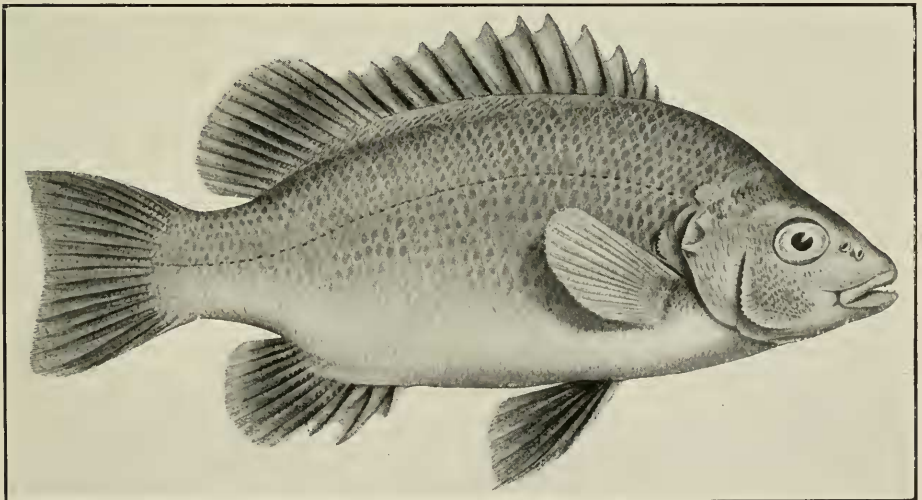


Fig. 2.—THERAPON FULIGINOSUS Macleay.  $\frac{5}{9}$  Nat. Size.

A. R. McCulloch, del.

Page 117.





Preorbital entire; vertical limb of preopercle coarsely serrated, the serræ gradually decreasing on the rounded angle and disappearing on the lower limb; opercle with two spines, the lower the longer; post-clavicle with a few coarse denticles; humeral entire.

Teeth as in *T. unicolor*.

Scales in 63 series above, 58 below the lateral line; transverse series from below origin of dorsal 10/1/23; cheek-scales in 7 series. Lateral line tubes 56.

Dorsal fin with xii 13 or 14 rays, originating above the pectoral-base, the length of the soft portion 1.6 to 1.75 in that of the spinous, which is low, with the spines strong and pungent, the 1st very short, less than a fourth of the 5th and 6th, which are the longest, 2.5 to 2.67 in the length of the head; beyond these they are finely graded to the last, which is nearly as long as the 3rd and 1.3 in the longest spine; soft dorsal rounded, the antero-median spines the longest. 1.3 in its base, and from one tenth to two sevenths more than the longest spines. Caudal fin rounded, the middle rays 4.8 to 5 in the body-length. Anal fin with iii 11 or 12 rays, originating below the last dorsal spine; spines short and stout, curved, the 1st 1.67 in the 2nd, which is stronger and a little longer than the 3rd, 2.65 to 2.75 in the length of the head, and 1.15 to 1.33 in the longest ray; soft fin similar to but much shorter and a little higher than the soft dorsal, its base as long as or a little shorter than its height. Pectoral obtusely pointed, with 16 rays, the 6th the longest, 4.6 to 4.85 in the body-length. Ventral inserted behind the pectoral base, pointed, the spine moderate and rather short, 1.67 to 1.8 in the fin to the tip of the outer ray, which is slightly produced, a little shorter than the pectoral, 1.65 to 1.8 in the length of the head, and extending to midway between its origin and the 3rd anal ray.

Gill-rakers 5+11, rather short and stout, the longest about one third of the eye-diameter.

Uniform blackish. (*carbo*, a lump of coal.)

Described from two specimens, measuring respectively 150 and 182 millim., collected by Dr. Bancroft in the upper waters of the Gregory River, District of Carpentaria.

Regarding this fish Dr. Bancroft writes—"I found this black fish at Gregory Plains, south-west of Burketown, where it is common; when fishing for it I found that it behaved in exactly the same manner as I have already described the Eureka Creek fish as doing (*see* p. 120). It is a fine game fish, growing to a weight of four pounds and over, and is of excellent quality for the table."

*Illustration*.—Our figure is taken from the smaller of the two examples mentioned above. Reg. No. 1. 15/2445.

#### Therapon fuliginosus Macleay.

(Plate XII, fig. 2.)

*Therapon fuliginosus* Macleay, Proc. Linn. Soc. N. S. Wales, viii, pt. 2, 17 July, 1883, p. 201.

#### SOOTY GRUNTER.

*Type locality*.—Upper Burdekin River, N.Q.

D. xii 13; A. iii 9-10; P. 15-16; V. i 5; C. 17. Between the origin of the lateral line and the hypural joint, there are 46-50 series of scales counted below the

lateral line, and 51-58 above it; 9-10 scales between the lateral line and the middle of the spinous dorsal. Cheek-scales in about 8 or 9 rows, the lower ones very small.

Proportions of two specimens 126 and 210 mm. long:—Depth 2·6 in the length to the hypural joint; head 2·9-3·1 in the same. Eye 4·4-5 in the head, and 1·3-1·4 in the snout, which is 3·1 in the head. Sixth dorsal spine 2·1-2·4, median dorsal rays 1·7-2, second anal spine 2·5-2·7, and third anal ray 1·8-1·9 in the head.

Body somewhat elevated, compressed. Snout obtusely pointed, the upper profile of the head almost straight in the young, concave in adults; it is distinctly arched from the nape to the origin of the dorsal fin. Interorbital space almost flat, without bony ridges. Jaws equal. Maxillary reaching almost to the anterior orbital border or to below the first fourth of the eye; its posterior portion exposed. Eye of moderate size, shorter than the snout; its length is a little greater than the interorbital width in young specimens, and less than it in adults. Nostrils separated by a space which is a little wider than their own diameter, with free skinny margins, the anterior with a distinct lobe. Preorbital bone obscurely denticulated in the young, entire in adults. Preoperculum evenly denticulate, the denticles largest above the rounded angle. Operculum with two flat spines, the lower the larger, but not reaching beyond the opercular lobe. Suprascapular and coracoid bones exposed and more or less denticulate.

Each jaw with a band of teeth, the outer series of which is enlarged, cylindrical, and acute. Palate toothless. Gill-rakers well developed and rather slender, about sixteen on the lower limb of the first arch. Scales largest on the anterior portions of the sides, very small on the breast. They form the usual sheaths at the bases of the dorsal and anal spines, and extend up between the bases of the dorsal, anal, and caudal rays.

Dorsal spines moderately strong, the sixth the longest, almost as long as the median rays in young specimens, but much shorter than them in adults; the last spine is not longer than the penultimate one: soft dorsal rounded, its median rays longest. Second anal spine stronger, and a little longer than the third, but much shorter than the anterior rays: soft anal either rounded or a little angular. Pectoral somewhat rounded, the fifth upper ray longest. Ventrals inserted below the third or fourth dorsal spine, almost or quite reaching the vent. Caudal emarginate.

Uniform dark purplish brown, each scale with a lighter margin. Soft dorsal and anal with a wide greyish border; pectorals grey with a more or less distinct dark bar across the base; tips of ventral rays translucent grey.

Described from six specimens 126-327 mm. long, of which five are Macleay's original specimens, from the Upper Burdekin River. The other is 210 mm. long, and was taken in the upper waters of the Burdekin River; it is figured on Plate XII. Macleay's description is evidently based on the larger examples, and his proportions consequently differ slightly from those given above. In a specimen 327 mm. long the depth is just one third of the total length or 2·5 in the length to the hypural joint; the eye is but little more than half as long as the snout, as he describes it.

*Remarks*:—Macleay remarked that this species was "a thick heavy fish, attaining a length of 15 inches, and seemingly abundant." We may assume that in its habits and qualities as a food-fish it does not differ materially from its relatives.

**THERAPON BANCROFTI** sp. nov.

(Plate XI, fig. 2.)

**PURPLE GRUNTER.***Type locality* :—Eureka Creek, Stannary Hills, N.Q.

Body subovate, the dorsal and ventral contours sub-symmetrical in the young, the former more strongly arched in the adult, its width 1.67 to 1.85 in its depth, which is 2.67 to 2.8 in its length and equal to one sixth more than the length of the head; caudal peduncle a little longer than deep, its least depth 7.4 to 7.8 in the body-length. Head about three tenths longer than deep, its upper profile linear or feebly concave to above the middle of the eye, beyond which it merges into the occipito-nuchal convexity, imperceptibly in the young but with a decided protuberance in the adult, its width 1.6 to 1.8 in its length, which is 2.75 to 3.15 in that of the body. Snout obtuse and broadly rounded anteriorly, its length 2.55 to 2.85 in that of the head; lips thick and fleshy. Eye small, its diameter 1.8 to 1.9 in the length of the snout and 2 to 2.4 in the postorbital head; interorbital region convex, its width 1.33 to 1.67 in the length of the snout. Maxillary not extending to the vertical from the anterior border of the eye. Preorbital entire or with a few coarse denticles posteriorly; preopercle broadly rounded, the vertical limb and angle with coarse serræ, which become blunted with age; opercle with two spines, the lower the longer; post-clavicle and humeral bones rugose.

Jaws with a broad band of villiform teeth and an outer series of strong conical approximate teeth, the extremities of which are slightly recurved; tips of all the teeth golden bronze.

Scales in 57 to 61 series above, in 51 to 55 below the lateral line; 11/1/20 or 21 scales in the series extending obliquely backwards from the base of the 1st dorsal spine: cheek-scales small, in 8 irregular series below the middle of the eye. Lateral line tubes 50 or 51.

Dorsal fin with xii 12 or 13 rays, originating above or a little behind the lower angle of the pectoral base, the length of the soft portion 1.5 to 1.6 in that of the spinous, which is low, with the spines rather slender but pungent, the 1st very short, less than a fourth of the 5th and 6th, which are the longest, 2.75 to 3.1 in the length of the head; beyond these the spines are finely graded to the penultimate, which is a trifle shorter than the last; soft dorsal obtusely pointed, the posterior middle rays the longest, 1.25 to 1.5 in its base, and from two fifths to three fifths more than the longest spines. Caudal fin emarginate with the angles rounded, the middle rays 5 to 5.35 in the body-length. Anal fin with iii 8, sometimes 9, rays, the last divided to the base; spines short and stout, the 1st about five ninths of the 2nd, which is stronger and a little longer than the 3rd, 3 to 3.2 in the length of the head, and 1.55 to 1.7 in the longest ray; soft fin similar to but much shorter and a little higher than the soft dorsal, its length 1.5 to 1.65 in its height. Pectoral obtusely pointed, with 16 rays, the 5th the longest, its length 4.6 to 4.85 in that of the body. Ventral originating well behind the pectoral base, rounded, the spine short and stout, less than half of the fin to the tip of the 2nd ray, which is a little longer than the 1st, as long as or a little shorter than the pectoral, 1.6 to 1.8 in the length of the head, and extending to midway between its origin and the 4th anal ray or less.

Gill-rakers 7+17, well developed and rather slender, the longest about 2.25 in the eye-diameter.

Upper surf  $\&$  ce of head and trunk and entire tail dark purplish brown, becoming lighter on the sides of the trunk, where many of the scales develop a lavender-gray

central spot, which increases in size and intensity towards the abdomen; throat and abdomen pale brown, uniform or with large bluish white blotches, which are irregular in shape and position. Sides of head brown; edge of upper lip, lower lip, and intermandibular space livid white or, in the case of the latter, light brown. Unpaired fins blackish, the tips of the posterior dorsal and anal rays and the outer half of the caudal shading to lavender; pectorals and outer half of ventrals gray. (Named after Dr. Thomas Lang Bancroft, to whose researches in many branches of natural science Queensland is much indebted.)

Described from 4 specimens, measuring between 205 and 260 millim., collected by Dr. T. L. Bancroft in Eureka Creek, a feeder of the Walsh River (itself a tributary of the Mitchell) in the Stannary Hills mining district of York Peninsula. One of these belongs to the Amateur Fishermen's Association of Queensland, by which it was kindly lent to us for comparison with the specimens in the State Museum.

Our knowledge of this fish has been derived entirely from notes kindly communicated by Dr. Bancroft. He states that it is common in Eureka Creek and is known in that district as the "Black Bream"; that it grows to fully a pound and a half in weight, is a strong and plucky fighter, and is of excellent quality as a table fish. That it is also a fish of considerable cunning and quite competent to take care of itself appears from the following extract:—"When fishing for it I have always noticed that it is easy to catch the first fish, but that you will hardly ever get another in the same place. Directly you drop the bait in a deep rocky pool it is seized, and when drawing up your struggling victim others of the school accompany it to the surface. After that none of the fishes in that pool will look at your bait, so you have just got to move away to the next suitable spot."

*Illustration* :—Taken from a fine example, 248 millim. long, now on exhibit in the Queensland Museum. Reg. No. I. 15/2318.

#### Therapon trimaculatus Macleay.

(Plate XIII, fig. 1.)

*Therapon trimaculatus* Macleay, Proc. Linn. Soc. N. S. Wales, viii, pt. 2, 17 July, 1883, p. 258.

#### BANDED GRUNTER.

*Type locality* :—Goldie River, B.N.G.

D. xiii 11-13; A. iii 10-11; 46-50 series of scales between the origin of the lateral line and the hypural joint counted below the lateral line, and 47-54 above it;  $6\frac{1}{2}$ - $7\frac{1}{2}$  between the lateral line and the middle of the spinous dorsal. Cheek-scales in 6-7 rows.

Depth 2.2-2.5 in the length to the hypural joint; head 2.9 in the same. Eye 1.1-1.4 in the snout, and 3.7-4.6 in the head; snout 2.8-3.7 in the head. Fifth dorsal spine 2, second dorsal ray 1.5-1.6, and second anal spine 2.6-2.8 in the head.

Body deep, compressed. Snout obtusely pointed, the upper profile almost straight to the nape where it is convex; interorbital space almost flat, the bony ridges of the upper surface of the head but feebly developed. Jaws equal. Maxillary reaching back to behind the vertical of the posterior nostril, or to below the anterior portion of the eye; its posterior portion exposed. Eyes not very large, equal to the snout in young specimens, smaller in adults; the interorbital width is slightly less than the length of the snout. Nostrils well separated, the anterior small and tubular, the other larger. Preorbital entire or with some small teeth posteriorly. Operculum with